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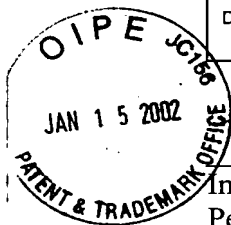
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*Elena Maglitta*  
(Elena Maglitta)

Docket No.: HO-P02306US0  
(PATENT)

Receipt



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:  
Peter Goldstein, et al.

Application No.: 09/976,555

Group Art Unit: 1632

Filed: October 12, 2001

Examiner: Not Yet Assigned

For: CLOSED-LOOP FOCAL POSITIONING  
SYSTEM AND METHOD

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TRANSMITTAL LETTER

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Respectfully submitted,

By

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APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
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CONFIRMATION NO. 1458

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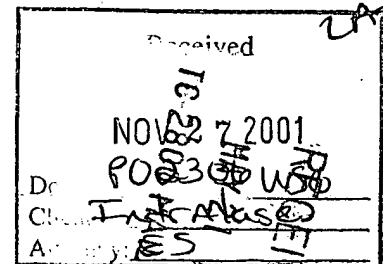
Early Publication Request: No

\*\* SMALL ENTITY \*\*

Title

Closed-loop focal positioning system

and method



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Preliminary Class  
435

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Utility Application

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR U.S. LETTERS PATENT

Title:

CLOSED-LOOP FOCAL POSITIONING SYSTEM AND METHOD

Inventors:

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## CLOSED-LOOP FOCAL POSITIONING SYSTEM AND METHOD

### BACKGROUND OF THE INVENTION

[0001] Various laser procedures or operations require that the laser beam be properly focused to a specific focal point. For example, in ophthalmic laser surgery wherein eye tissue is to be photodisrupted or ablated in or on the tissue that is to be affected, the correct positioning of a focusing assembly used to focus a laser beam is very critical. Such ophthalmic surgical procedures include those in cornea, sclera, iris, the crystalline lens and related structures, vitreous, and retina, and for treatment of glaucoma. Focal depth precision is also required in many non-ophthalmic laser surgical procedures, such as applications in dermatology and even "surgery" in DNA to excise portions of chromosomes. Also, non-biologic applications, such as photolithography and micromachining require focal depth precision.

[0002] Even with calibration of a focusing element for a laser, which is made to vary according to the requirement of the surgical treatment pattern, the actual focal depth of the laser beam may differ from the desired focal depth for the treatment and an actual focal depth. Hence, there is a need for a closed-loop system that controls movement of a focusing assembly to a desired position and feedback validation that the desired movement of the focusing assembly has been achieved. In this manner, the depth position of a focal point may be precisely controlled.

### SUMMARY OF THE INVENTION

[0003] The present invention relates generally to a closed-loop focal positioning system. More particularly, the invention relates to a method and system for moving a focusing assembly for focusing a laser beam to a desired position (also referred to as the theoretical position) and then determining via a feedback positioning device, an actual movement value of the focusing assembly.

[0004] Briefly stated, the closed-loop focal positioning system utilizes a computer processor for the execution of software to control the movement of a focusing assembly used to focus a laser beam. The software is configured to allow an operator to identify a laser focal point or depth. In turn, the focusing assembly is instructed to move to a desired position. A feedback positioning device reads the actual position or movement of the focusing assembly. A

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